Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/614,455	OH, HWA-SEOK
	Examiner	Art Unit	
	Scott Sun	2182	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>28 February 2006</u>.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-28* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-28* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Applicant's amendments to the specification filed 2/28/2006 has been noted and entered.

Response to Arguments

2.   Applicant's arguments filed 2/28/2006 have been fully considered but they are not persuasive. Applicant's arguments are summarized below:

    a.   Prior art of record (Connor) do not disclose "estimating" a packet time delay, but instead teaches only measuring.

    b.   Prior art of record do not disclose "going back to step (b) if the packet time delay has not passed".

    c.   Prior art of record do not teach "counting the number of received data frames *if the first time delay has not passed*".

    d.   Prior art of record do not teach "recognizing a type field of the received data frames".

    e.   Examiner does not distinguish between "predetermined type field" and "the recognized type field".

    f.   Examiner does not distinguish between "predetermined protocol field" and "the recognized protocol field".

    g.   Prior art of record (Satran and Bennett) do not teach Network Interface Card circuitry.

3.   In response to argument 'a', Examiner notes that applicant fails to distinguish between "estimating" and "measuring". The specification, as amended, simply <u>defines</u> the corresponding delays and still fails to provide any specific steps on how the claimed estimation is performed other than using a timer. A timer, by definition, is used to measure time.

Furthermore, measurements are estimations of a value (to the accuracy of the least significant digit). Accordingly, Connor's teachings of measuring the delay can be interpreted as estimating the delay.

4.   In response to argument 'b', Examiner notes that figure 4 shows an arrow going back to step #405 if no timer has not expired (step 525). Examiner further notes that previous designation of steps #526 and #431 were typos. They should be #525 and #435).

5.   In response to argument 'c', Examiner notes that, as stated in previous office action (page 7), the various conditions for causing an interrupt are taught by prior art of record including counting number of frames and expiration of timers. One of ordinary skill in the art would readily check one condition after another condition fails to cause an interrupt. In the instant case, one can check the number of frames after checking the timer has not expired to cause an interrupt.

6.   In response to argument 'd', Examiner notes that "end-of-data" flag in the header is the type field, and the flag indicating last packet is the predetermined

field. Prior art of record teaches that this flag is check to see if it matches the last packet value (predetermined).

7.   In response to argument 'e', Examiner notes that protocol field is the recognized protocol field, and TCP or UDP protocols are predetermined protocol fields. Prior art of record teaches that the protocol field is checked to see if the protocol matches TCP or UDP (predetermined).

8.   In response to argument 'f', Examiner notes that teachings of Bennet and Satran are directed toward network data processing. One of ordinary skill in the art at the time of invention would recognize the functions performed have associated network interface card circuitry.

9.   Having responded to each of applicant's arguments, Examiner notes that previous grounds of rejection still apply. Minor modifications are made to further clarify the reasoning of rejection.

Claim Rejections - 35 USC § 112

10.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11.   Claims 1-7, 9, 10, 12-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

12.   Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put

one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "estimate" in claims 1, 4, 6, 9, 12, 15, 18, 20, and 22 is used by the claims to mean "track", "measure" or "record", while the accepted meaning is "an approximate calculation." The term is indefinite because the specification does not clearly redefine the term. The evidence for interpreting applicant's intended meaning is found on in the specification on page 15, line 10, where estimation is performed by a timer, which is known in the art to simply track or record time. If the applicant does intend to use "estimate" to mean "an approximate calculation", the examiner asserts that specific algorithms to perform such estimation should either be disclosed in the specification, or conventional algorithms should be mentioned to allow a person of ordinary skill of art to make and use the invention.

13.   Claims 2, 3, 5, 7, 13, 14, 16, 17, 19, 21, 23-28 are rejected because of their dependence on the above rejected claims.

14.   The following rejections are made based on the examiner's best interpretation of the claims in light of the 35 USC 112 rejections above.

Claim Rejections - 35 USC § 102

15.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16.   Claim 4 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Connor (PG Pub # US 2003/0061426).

17.   Regarding claim 4, Connor discloses a method (figure 4) of generating interrupts of a network interface card which transceives data, the method comprising: a. receiving data frames (step 405, paragraph 28); b. estimating a packet time delay (packet timer) in response to the received data frames (step 405, 410, paragraph 28); c. determining whether the packet time delay has passed and generating an interrupt if the packet time delay has passed, or going back to step b if the packet time delay has not passed (step 425); d. stopping an operation of estimating the packet time delay and transmitting the received data frames (step 430, 435, paragraph 22); e. receive a new data frame and going back to step b. (step 405). Further regarding stopping operation, the examiner asserts that by definition of interrupt in the art, normal processing operations are stopped to process the interrupt routine.

18.   Regarding claim 5, Connor further discloses the method of claim 4, wherein the packet time delay is a time interval between received data frames (paragraph 26, figure 6). The examiner notes that the first packet timer threshold as defined by Connor is greater than minimum inter-frame gap and less than the sum of minimum inter-frame gap and packet time, which is less than the total

time required to receive and process each frame. This time period is therefore

between received data frames.

Claim Rejections - 35 USC § 103

19.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

20.   Claims 12-14 are rejected as being obvious over Connor, in view of Satran

et al (PG Pub # US 2002/0029305), Gentry Jr. et al (US 6,467,008), and Bennett

et al (US 6,345,302).

21.   Regarding claim 12, Connor discloses a method (figure 4) of generating

interrupts of a network interface card which transceives data, the method

comprising: estimating a second time delay in response to the received data

frames; determining whether the second time delay has passed and generating

the interrupt if the second time delay has passed; stopping operations of

estimating the second time delay in response to the generated interrupt and

transmitting the received data frames; stopping operations of estimating the first

time delay in response to the generated interrupt and transmitting the received

data frames; and receiving a new data frame and going back to estimating a first

time delay (see 102 rejection for claim 4 above for specific teachings and

examiner's arguments). Connor further discloses estimating a first time delay (figure 4, absolute timer); determining whether the first time delay has passed and generating an interrupt if the first time delay has passed (figure 4, step 426);

Connor does not teach explicitly counting number of data frames. However, Gentry discloses counting a number of data frames (figure 1, packet counter); and generating an interrupt if the number of received data frames is equal to N (figure 1, packet threshold, element 126, 128, 132; column 10, lines 45-53); Teachings of Gentry and Connor are from analogous art of network interfaces and specifically of interrupt handling.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's invention with Gentry's teachings by adding the packet counting circuits into the network interface in the system disclosed by Connor for the benefit of further reducing number of interrupts without preventing packets from being processed in a timely manner (column 3, lines 6-10)

Connor and Gentry combined does not teach explicitly determining a type field. However, Satran discloses determining whether the type field (last packet flag in the header) of the received data frames is identical to a predetermined type field (flag indicating last packet, paragraph 35, 36, figure 3) and generating an interrupt if the type field is identical to the predetermined type field (paragraph 36, figure 3). Teachings of Connor, Gentry, and Satran are from analogous art of network interfaces, and specifically of interrupt handling.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's and Gentry's teachings as above and further with Satran's teaching by adding circuitry or logic that recognizes a field in the packet header to recognize last packet of transmissions into the combined system of Connor and Gentry for the benefit of minimizing interrupts in determining when a transaction using RDMA has completed (paragraph 13).

Connor, Gentry, and Satran combined does not disclose explicitly determining the protocol field. However, Bennett discloses determining whether the protocol field (protocol field) of the received data frames is identical to a predetermined protocol field (TCP, UDP, figure 15); and generating an interrupt if the protocol field is identical to the predetermined protocol field (column 14, lines 25-30). Teachings of Connor, Gentry, Satran, and Bennett are from analogous art of network interfaces, and specifically to packet processing.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine Connor's, Gentry's and Satran's teachings as above and further with Bennett's teachings by adding the protocol logic circuitry disclosed by Bennett into the combined system of Connor, Gentry and Satran for the benefit of efficiently operating protocol in a computer network (summary of invention, first paragraph).

The examiner also makes the following assertions regarding rejection of the above claim. The claims, the specification and the drawings (in particular, figure 11) disclosed by the applicant show each of the five elements: first delay, second delay, frame count, type, and protocol can cause an interrupt. Each of

these elements are checked in order to see if an interrupt should be generated.

A person of ordinary skill in the art in light of the combination of Connor, Gentry,

Satran and Bennet's teachings can readily envision an order of checking each of

the elements, such as the order disclosed by the applicant (first delay, then count

of frames, then second delay, then type, and finally protocol).

22.   Regarding claim 13, Connor, Gentry, Satran, and Bennett discloses the

method of claim 12, wherein Connor further discloses the first time delay starts

from when a first data frame is received (figure 4, step 415).

23.   Regarding claim 14, Connor, Gentry, Satran, and Bennett discloses the

method of claim 12, wherein Connor further discloses the second time delay is a

time interval between the received data frames (paragraph 26, figure 6). Also

see examiner's argument above regarding claim 5.

24.   The examiner asserts that any subset of Gentry, Satran, and Bennet's

teachings can also be combined with Connor's teachings for the reasons given in

rejection of claim 12. The following rejections are made in light of this assertion.

25.   Claims 1-3 are rejected as being obvious over Connor, in view of Gentry.

These claims contain a subset of elements found in claim 12 and are rejected   .

using the same arguments as above.

26.   Claims 6-7 are rejected as being obvious over Connor in view of Gentry

and Satran. These claims contain a subset of elements found in claim 12 and

are rejected using the same arguments as above.

27.   Claim 8 is rejected as being obvious over Connor in view of Satran. This claim contains a subset of elements found in claim 12 and is rejected using the same arguments as above.

28.   Claims 9-10 are rejected as being obvious over Connor in view of Gentry and Bennet. These claims contain a subset of elements found in claim 12 and are rejected using the same arguments as above.

29.   Claim 11 is rejected as being obvious over Connor in view of Bennet. This claim contains a subset of elements found in claim 12 and is rejected using the same arguments as above.

30.   Claims 15-28 differ from claims 1-3, 6, 7, 9, 10, and 12-14 only in statutory category. Therefore the same arguments used.

31.   Further regarding claims 25-28, the examiner asserts in addition to the systems disclosed by the references cited above, hardware implementations of handling interrupts in network adaptors are well known in the art. Bennett further mentions the motivation for this approach would be to alleviate the need for the main computer processor to handle multiple interrupts (column 1, lines 60-63).

Conclusion

32.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Sun whose telephone number is (571) 272-2675. The examiner can normally be reached on M-F, 10:30am-7pm.
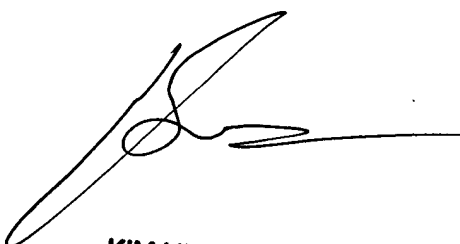
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim N. Huynh can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS
5/22/2006

KIM HUYNH
SUPERVISORY PATENT EXAMINE

5/26/06